Claims

1. An X-ray tube (11/12) for high dose rates, in which an anode (31/32) and a cathode (21/22) are disposed opposite each other in an vacuumized internal chamber (41/42), electrons (e^-) being able to be accelerated to the anode by means of impressible high voltage, wherein

the cathode (21/22) comprises a thin layer of an electron (e^-) -emitting material,

the cathode (21/22) comprises a substrate substantially transparent for X-ray radiation (γ).

2. The X-ray tube (11/12) according to claim 1, wherein the cathode (21/22) closes the vacuumized internal chamber (41/42) toward the outside.

3. The X-ray tube (11/12) according to one of the claims 1 or 2, wherein the anode (31/32) comprises gold and/or molybdenum and/or tungsten and/or a compound of the metals, for conversion of the electrons (e^-) into X-ray radiation (γ).

4. The X-ray tube (11/12) according to one of the claims 1 to 3, wherein the cathode (21/22) comprises of <sic.> a thermionic emitter (72).

5. The X-ray tube (11/12) according to one of the claims 1 to 3, wherein the cathode (21/22) comprises a cold emitter (72).

6. The X-ray tube (11/12) according to claim 5, wherein the cold emitter comprises metal tips and/or graphite tips and/or carbon nano tubes.

7. The X-ray tube (11) according to one of the claims 1 to 6, wherein the X-ray tube (11) is designed as an anode hollow cylinder (21) with a coaxial cathode hollow cylinder (31) inside.

8. The X-ray tube (12) according to one of the claims 1 to 6, wherein the anode (32) is designed as a round or angular surface, the anode (32) being irradiated by a laminar or reticulate emitter (72) in a cathode (22) substantially transparent for X-ray radiation (γ).

9. A method for generating high dose rates with X-ray tubes (11/12), in which an anode (31/32) and a cathode (21/22) are disposed opposite each other in a vacuumized internal chamber (41/42), electrons (e^-) being accelerated to the anode (31/32) by means of impressible high voltage, wherein

a substrate substantially transparent for X-ray radiation (γ) is used in the cathode (21/22), and

a thin layer or coating of an electron (e^-)-emitting material is applied to the substrate.

10. The method according to claim 9, wherein the cathode (21/22) closes the vacuumized internal chamber (41/42) toward the outside.

11. The method according to one of the claims 9 or 10, wherein gold and/or molybdenum and/or tungsten and/or a compound of the metals is used for conversion of the electrons (e^-) into X-ray radiation (γ).

12. The method according to one of the claims 9 to 11, wherein a thermionic emitter is used in the cathode (21/22).

13. The method according to one of the claims 9 to 12, wherein a cold emitter is used in the cathode (21/22).

14. The method according to claim 13, wherein metal tips and/or graphite tips and/or carbon nano tubes are used for the cold emitter.

15. The method according to one of the claims 9 to 14, wherein used as the anode is an anode hollow cylinder (21) with a coaxial cathode hollow cylinder (31) inside.

16. The method according to one of the claims 9 to 15, wherein the anode (32) is designed as a round or angular surface, the anode (32) being irradiated by an emitter (72), of laminar or reticulate design, in a cathode (22) substantially transparent for X-ray radiation (γ).

17. A method for producing an X-ray tube (11/12) for high dose rates, in which an anode (31/32) and a cathode (21/22) are disposed opposite each other in a vacuumized internal chamber (41/42), electrons (e^-) being accelerated to the anode (31/32) by means of impressible high voltage, wherein

a substrate substantially transparent for X-ray radiation (γ) is used in the cathode (21/22), and

a thin layer or coating of an electron (e^-)-emitting material is applied to the substrate.

18. The method according to claim 17, wherein the cathode (31/32) closes the vacuumized internal chamber (41/42) toward the outside.